

**CLAIMS:**

1. A catheter system comprising:  
a catheter defining an internal lumen;  
a balloon mounted on the catheter, the balloon defining an internal chamber in fluid communication with the lumen;  
a charging mechanism including a closed reservoir, a passage, and an actuator to charge and discharge the balloon with at least a portion of a volume of fluid contained in the closed reservoir, wherein the closed reservoir is in fluid communication with the lumen via the passage and substantially sealed from an environment outside the catheter system; and  
a pressure sensor in fluid communication with the lumen to sense a pressure of the fluid.
2. The catheter system of claim 1, wherein the fluid is a gas.
3. The catheter system of claim 1, wherein the fluid is a liquid.
4. The catheter system of claim 1, further comprising a monitoring device to monitor the sensed pressure.
5. The catheter system of claim 1, further comprising a sensor body that houses the sensor, and a catheter body coupled to a proximal end of the catheter and the sensor body, the catheter body defining a channel for fluid communication between the lumen and the sensor, wherein the reservoir and the charging mechanism are housed in the sensor body.
6. The catheter system of claim 5, further comprising a seal member disposed between the sensor body and the catheter body.
7. The catheter system of claim 6, wherein the seal member includes a deformable surface that deforms under compression upon engagement of the sensor body and the catheter body to produce a fluid seal about the channel.

8. The catheter system of claim 1, further comprising a catheter body coupled to a proximal end of the catheter, wherein the reservoir and the charging mechanism are housed in the catheter body.
9. The catheter system of claim 8, further comprising a sensor body that houses the sensor, wherein the sensor body is coupled to the catheter body, wherein the catheter body defines a channel for fluid communication between the lumen and the sensor.
10. The catheter system of claim 9, further comprising a seal member disposed between the sensor body and the catheter body.
11. The catheter system of claim 10, wherein the seal member includes a deformable surface that deforms under compression upon engagement of the sensor body and the catheter body to produce a fluid seal about the channel.
12. The catheter system of claim 1, further comprising a sensor body that houses the sensor, a catheter body coupled to a proximal end of the catheter, and an intermediate body coupled to the sensor body and the catheter body, the catheter body defining a first channel for fluid communication with the lumen, the intermediate body defining a second channel for fluid communication between the first channel and the sensor, wherein the reservoir and the charging mechanism are housed in the intermediate body.
13. The catheter system of claim 12, further comprising a first seal member disposed between the intermediate body and the catheter body, and second seal member disposed between the sensor body and the intermediate body.
14. The catheter system of claim 13, wherein the first seal member includes a deformable surface that deforms under compression upon engagement of the sensor body and the intermediate body to produce a fluid seal about one of the first channel and the second channel.

15. The catheter system of claim 1, wherein the actuator includes a piston, and the distal end of the piston is movable to drive at least a portion of the fluid out of the reservoir and into the lumen to charge the balloon.
16. The catheter system of claim 1, wherein the actuator includes a screw, wherein the distal end of the screw is movable to drive at least a portion of the fluid out of the reservoir and into the lumen to charge the balloon.
17. The catheter system of claim 1, wherein the charging mechanism includes an elastic nipple, wherein pushing the nipple charges the balloon.
18. The catheter system of claim 1, wherein the pressure sensor comprises a strain gauge.
19. A method comprising:
  - placing a catheter into a patient, wherein the catheter includes an internal lumen and a balloon defining an interior chamber in fluid communication with the lumen;
  - sensing a first pressure within the lumen;
  - charging the balloon with at least a portion of a volume of fluid contained within a closed reservoir; and
  - sensing a second pressure within the lumen.
20. The method of claim 19, wherein the fluid is a gas.
21. The method of claim 19, wherein the fluid is a liquid.
22. The method of claim 19, wherein sensing a first pressure of the fluid within the closed reservoir comprises calibrating the catheter system such that the pressure within the catheter system is approximately zero.
23. The method of claim 19, further comprising discharging the balloon.

24. The method of claim 19, further comprising removing the catheter from the patient.
25. The method of claim 23, further comprising recharging the balloon.
26. The method of claim 19, wherein charging the balloon includes pushing on an elastic nipple.
27. The method of claim 19, wherein charging the balloon includes moving an actuator into the closed reservoir.
28. The method of claim 27, wherein the actuator is one of a piston and a screw.
29. The method of claim 23, wherein discharging the balloon comprises venting the fluid via an opening in the catheter system.
30. The method of claim 23, wherein discharging the balloon comprises removing an actuator from the closed reservoir of fluid, thereby allowing the volume of the closed reservoir to increase.
31. A catheter system comprising:
  - a catheter defining an internal lumen;
  - a balloon mounted on the catheter, the balloon defining an internal chamber in fluid communication with the lumen;
  - means for charging the balloon with at least a portion of a volume of fluid contained within a closed reservoir, wherein the reservoir is substantially sealed from an environment outside the catheter system; and
  - means for sensing a pressure of the fluid.
32. The catheter system of claim 31, further comprising a monitoring device to monitor the sensed pressure.

33. The catheter system of claim 31, further comprising a sensor body that houses the sensing means, and a catheter body coupled to a proximal end of the catheter and the sensor body, the catheter body defining a channel for fluid communication between the lumen and the sensor, wherein the reservoir and the charging means are housed in the sensor body.

34. The catheter system of claim 31, further comprising a catheter body coupled to a proximal end of the catheter, wherein the reservoir and the charging means are housed in the catheter body.

35. The catheter system of claim 31, further comprising a sensor body that houses the sensor, a catheter body coupled to a proximal end of the catheter, and an intermediate body coupled to the sensor body and the catheter body, the catheter body defining a first channel for fluid communication with the lumen, the intermediate body defining a second channel for fluid communication between the first channel and the sensor, wherein the reservoir and the charging means are housed in the intermediate body.

36. A catheter body for a balloon catheter system, the catheter body comprising:  
a first fitting to couple the catheter body to a catheter;  
a second fitting to couple the catheter body to a sensor body;  
a charging mechanism including a closed reservoir, a passage, and an actuator to charge and discharge a balloon mounted on the catheter via a lumen with at least a portion of a volume of fluid contained in the closed reservoir, wherein the closed reservoir is in fluid communication with the lumen via the passage and substantially sealed from an environment outside the balloon catheter system.

37. A sensor body for a balloon catheter system, the sensor body comprising:  
a first fitting to couple the sensor body to a catheter body;  
a second fitting to couple the sensor body to a monitor;  
a charging mechanism including a closed reservoir, a passage, and an actuator to charge and discharge a balloon mounted on the catheter via a lumen with at least a portion of

a volume of fluid contained in the closed reservoir, wherein the closed reservoir is in fluid communication with the lumen via the passage and substantially sealed from an environment outside the balloon catheter system.

38. An intermediate charging body for a balloon catheter system, the charging body comprising:

- a first fitting to couple the charging body to a catheter body coupled to a balloon catheter;

- a second fitting to couple the charging body to a sensor body;

- a charging mechanism including a closed reservoir, a passage, and an actuator to charge and discharge a balloon mounted on the catheter via a lumen with at least a portion of a volume of fluid contained in the closed reservoir, wherein the closed reservoir is in fluid communication with the lumen via the passage and substantially sealed from an environment outside the balloon catheter system.